

# COTTON GIN OPERATING COSTS IN WEST TEXAS 1971-72





## ABSTRACT

Average operating costs per bale for West Texas gins during the 1971/72 season were: out-of-pocket--\$27.05, up \$7.04 or 35 percent from the 1970/71 season; total--\$32.57, up \$8.50 or 35 percent; and total standardized--\$36.99, up \$10.17 or 38 percent. The 46 plants, grouped by rated hourly capacities, ginned 16.6 percent of the total West Texas cotton crop. Compared with 1970/71, ginning volumes were down and costs up for all gin size groups. The average ginning volume for all groups combined decreased 32 percent for the season, while the average rate of gin plant capacity use was down 16 percentage points--from 48 to 32 percent. Adverse crop conditions in 1971/72 resulted in (1) 29 percent more seed cotton being required per bale of lint than in 1970/71 and (2) the lowest rates of capacity utilization and highest operating costs per bale in the 7-year history of this study.

Keywords: Cotton, ginning, costs, rates, capacity, utilization.

## PREFACE

This is the sixth annual report of cotton gin operating costs based on a sample of West Texas gins.

Objectives of the research are to (1) determine the current cost of ginning on the High Plains of West Texas and observe trends over time, (2) analyze the effects of changes in ginning volumes on ginning costs, and (3) consider the possibilities of reducing operating costs through more efficient ginning.

Similar studies are being conducted in the Blacklands and Lower Rio Grande Valley of Texas, the Midsouth, and the San Joaquin Valley of California. Area ginners use these findings as benchmarks or guides in evaluating the efficiencies of their own operations.

Gin cost information and records are mailed in annually for use in preparing these reports. The authors express their appreciation to the gin owners, managers, and accountants for their continued cooperation and assistance in this work.

# COTTON GIN OPERATING COSTS IN WEST TEXAS--1971/72

by

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## INTRODUCTION

This report compares average costs and volumes ginned in West Texas in the 1971/72 season with costs and volumes for 1970/71.

The gin sample is stratified into four groups, based on rated hourly capacities of the gin stand complexes. These are: Group 1--8 bales or less; group 2--9 to 11 bales; group 3--12 to 20 bales; and group 4--21 bales or more. Size and content of the gin sample vary from year to year, mainly because of periodic plant modifications which frequently alter capacity. This necessitates an annual review and reclassification of some plants into other size groups and the filling of voids thus created. During the 1971/72 season, the 46 plants in the sample ginned a total of 190,014 bales--16.6 percent of the total ginnings for the West Texas area.

## FINDINGS

Volumes ginned.--Average volumes ginned were down this season, resulting in the lowest rates of gin plant capacity utilization and the highest operating costs per bale in the 7-year history of this study. <sup>2/</sup> Compared with last season, volumes in 1971/72 ranged from 17 percent lower for group 2 plants

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<sup>1/</sup> Shaw and Wilmot are agricultural economists, and Heron is an economic assistant.

<sup>2/</sup> Ratio of volume ginned to estimated total seasonal ginning capacity without seed cotton storage. Based on typical ginning season of 906 operating hours and a sustained seasonal ginning rate capability set at 85 percent of rated capacity.



to 47 percent lower for group 3 plants; for all groups combined, average volume decreased 32 percent--from 6,066 to 4,131 bales (table 1). Smaller ginning volumes resulted in lower rates of ginning capacity utilization in each size group. The gin capacity utilization rate for all groups combined decreased 16 percentage points--from 48 percent to 32 percent.

Due to adverse crop conditions in 1971/72, 29 percent more machine-stripped seed cotton was required per bale of lint--increasing from 2,176 pounds in 1970/71 to 2,813 pounds in 1971/72. 3/ While gins handled approximately the same seed cotton tonnage in 1971/72 as in 1970/71, the higher trash-to-lint ratio resulted in 32 percent fewer lint bales and also resulted in gins operating at less than normal hourly rated capacities. This accounts for the increase in costs per bale for labor, energy, and other inputs.

Costs per bale at actual percentages of capacity utilization.--The 1971/72 weighted average total cost was \$32.57 per bale, 4/ an increase of \$8.50 from last season (tables 2 and 3). 5/ Group 4 showed the greatest increase in average total cost over last year--from \$22.41 to \$32.71 per bale.

Standardized sample gin cost 6/ averages ranged from \$34.47 for group 2 to \$38.58 for group 4, with a weighted average cost of \$36.99 per bale. Last year, these costs ranged from \$26.19 for group 4 to \$28.63 for group 1; the weighted average was \$26.82 per bale.

Out-of-pocket costs ranged from \$26.38 per bale for group 3 to \$28.58 for group 1. The weighted average was \$27.05 per bale. Compared with last season, average out-of-pocket costs in 1971/72 were higher in all size groups, ranging from \$5.88 more per bale for group 1 to \$9.01 more for group 4. The weighted average rise in out-of-pocket costs from 1970/71 to 1971/72 was \$7.04 per bale.

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3/ Figures shown are from unpublished data used in compiling Charges for Ginning Cotton, Costs of Selected Services Incident to Marketing and Related Information, Season 1971/72 and 1970/71. U.S. Dept. Agr., Econ. Res. Serv. and Agr. Mktg. Serv., May 1972 and May 1971.

4/ Taken from gin records and subjected to uniform allocation procedures as outlined in the appendix.

5/ See weighting procedure in appendix.

6/ See costing methods in appendix.



Table 1--Rated hourly capacities, volumes ginned, and capacity utilization, sample gin plants by size group, West Texas, 1970/71 and 1971/72

Season and gin size group	Rated hourly capacity 1/		Annual volume ginned		Rate of capacity utilization 2/	
	Range	Average	Range	Average	Range	Average
-----Bales-----						
1970/71:						-----Percent-----
Group 1.....	7- 8	7.6	1,727-	5,659	3,430	28- 92
Group 2.....	9-11	9.2	1,957-	5,203	3,517	28- 69
Group 3.....	12-20	15.8	2,180-	13,400	6,093	20-109
Group 4.....	21-60	32.7	3,078-	15,444	10,954	12- 81
Combined.....	7-60	16.5	1,727-	15,444	6,066	12-109
1971/72:						
Group 1.....	7- 8	7.6	1,067-	4,106	1,920	18- 67
Group 2.....	9-11	9.7	1,456-	5,114	2,909	21- 60
Group 3.....	12-20	15.0	2,000-	4,723	3,243	19- 42
Group 4.....	22-60	32.5	2,785-	11,324	7,838	11- 63
Combined.....	7-60	16.7	1,067-	11,324	4,131	11- 67

1/ Based on observations in plants operating under normal conditions. Differences in group averages between seasons are due to sample gin plant modifications which altered rated capacity and size group classifications.

2/ Ratio of volume ginned to estimated total seasonal ginning capacity without seed cotton storage. Based on typical ginning season of 906 operating hours and a sustained seasonal capability estimated at 85 percent of rated hourly capacities.

For all four groups and the weighted average, individual items making up out-of-pocket costs were all higher in 1971/72 than in 1970/71, except for group 1 repairs which were lower. Labor showed the greatest absolute rise in weighted average cost from the previous season, followed by management, repairs, miscellaneous, and energy, in that order. Increases in these five items amounted to \$2.52, \$1.09, \$0.98, \$0.87, and \$0.69 per bale. Group 2, with the highest average rate of capacity utilization, had the lowest total and standardized total costs per bale.

Cost per bale at 70 percent capacity utilization.--To allow cost comparisons at the same relative ginning volume levels, group average costs were adjusted to a uniform utilization rate of 70 percent of capacity (table 4). <sup>7/</sup> This adjustment lowered costs per bale substantially for all groups, pointing up the beneficial effect of increased volumes on unit operating costs regardless of plant size (tables 2, 3, and 4).

During 1971/72, no consistent pattern of economies of scale was evident as in past study years. Crop conditions varied from gin to gin regardless of size and manifested varying effects on labor, energy, repairs, miscellaneous inputs and costs per bale.

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<sup>7/</sup> See Cost Adjustments in appendix.



Table 2--Costs per bale in sample gin plants by size group, and average for all plants, West Texas, 1970/71 1/

Cost item 2/	Group 1		Group 2		Group 3		Group 4		Weighted Average 4/
	Range 3/	Average	Range 3/	Average	Range 3/	Average	Range 3/	Average	
Dollars									
Management.....	1.68- 9.84	3.73	2.64- 5.59	3.72	1.81- 5.08	2.77	.99- 5.04	2.17	3.09
Insurance.....	.18- .78	.40	.22- .51	.33	.20- .77	.39	.14- .89	.30	.36
Taxes.....	.13- .90	.41	.20- .76	.41	.13- .80	.27	.10- 1.26	.38	.36
Energy.....	1.28- 2.55	1.88	.73- 3.72	1.70	1.51- 3.20	2.04	1.26- 2.92	1.91	1.89
Labor.....	4.49- 6.97	5.96	3.70- 6.79	4.57	3.29- 6.35	4.31	3.13- 4.94	4.22	4.72
Bagging and ties..	2.66- 3.14	2.96	2.56- 3.27	2.92	2.69- 3.24	3.09	2.81- 3.19	3.07	3.01
Repairs.....	2.97- 8.26	5.11	1.79- 6.64	3.84	1.87- 5.67	3.92	2.75- 7.81	4.25	4.23
Miscellaneous.....	1.28- 5.80	2.24	1.15- 7.66	3.06	1.47- 5.00	2.28	1.16- 3.25	1.72	2.35
Out-of-pocket subtotal 5/.....	18.86-30.89	22.70	15.73-31.32	20.55	15.98-23.83	19.08	14.90-27.24	16.02	20.01
Depreciation.....	.98- 4.80	3.09	.82- 4.74	2.15	1.86- 8.96	4.06	2.53-12.85	4.04	3.37
Interest.....	0 - 5.09	1.05	0 - 5.36	.59	0 - 2.76	.73	0 - 1.13	.34	.68
Total	21.26-35.19	26.84	16.55-32.81	23.29	19.96-34.27	23.88	17.71-41.22	22.41	24.07
Standardized depreciation 6/...	2.42- 5.91	3.60	2.01- 6.33	3.62	2.49- 8.43	4.40	3.31-15.89	5.07	4.17
Standardized interest 6/.....	1.55- 3.93	2.34	1.39- 4.19	2.39	1.71- 5.22	2.73	2.01- 9.77	3.10	2.64
Total standardized 7/:	24.07-40.73	28.63	21.21-41.84	26.56	22.49-37.48	26.21	20.22-52.90	26.19	26.82

1/ Rated hourly ginning capacity: Group 1--6 bales or less; group 2--9 to 11 bales; group 3--12 to 20 bales; group 4--21 bales or more. The universe includes all active gins in the study area. 2/ Taken from gin records and subjected to uniform allocation procedures--see appendix. 3/ Low and high values shown for individual cost items indicate ranges among sample gins within a size group. Since the same gin plant was not consistently lowest or highest for all cost items, individual costs will not add to totals shown. 4/ Sample averages across groups, weighted by each group's representative proportion of the total rated hourly ginning capacity in the study area gin universe. 5/ Sample gin cost excluding depreciation and interest. 6/ Sample gin costs using uniform rates in computing depreciation and interest--see appendix. 7/ Out-of-pocket costs plus standardized depreciation and standardized interest.

Note: Individual cost items may not add to totals because of rounding.

Table 3--Costs per bale in sample plants by size group, and average for all plants, West Texas, 1971/72 1/

Cost item 2/	Group 1		Group 2		Group 3		Group 4		Weighted average 4/
	Range 3/	Average	Range 3/	Average	Range 3/	Average	Range 3/	Average	
----- Dollars -----									
Management.....	1.77-14.56	5.97	3.39- 6.84	4.34	2.17- 5.20	3.94	1.35- 5.55	3.16	4.18
Insurance.....	.28- 1.60	.68	.34- .98	.57	.49- 1.09	.65	.22- .96	.48	.59
Taxes.....	.25- 1.32	.71	.14- 1.20	.57	.23- .69	.44	.13- 1.36	.53	.55
Energy.....	1.86- 4.10	2.62	.87- 4.92	2.19	1.98- 3.90	2.73	1.93- 4.22	2.80	2.58
Labor.....	7.00- 9.70	8.00	6.00-10.36	7.06	5.36- 8.56	7.13	4.82-10.22	7.10	7.24
Bagging and ties..	3.05- 3.85	3.40	3.28- 3.81	3.47	3.31- 3.64	3.49	2.87- 3.78	3.55	3.49
Repairs.....	2.55- 6.48	4.32	2.79- 6.62	4.86	2.34- 7.14	4.80	2.75-11.14	6.56	5.21
Miscellaneous.....	1.38- 5.50	2.87	1.22- 8.67	3.78	1.65- 5.50	3.20	1.53- 4.14	2.86	3.22
Out-of-pocket subtotal 5/.....	20.82-41.16	28.58	21.94-35.78	26.84	23.96-29.31	26.38	19.05-35.67	27.03	27.05
Depreciation.....	1.17- 9.12	3.70	.64- 9.80	3.28	2.23- 9.66	5.88	2.91-13.46	4.95	4.53
Interest.....	0 - 4.90	1.54	0 - 8.45	.86	0 - 3.42	1.08	0 - 2.60	.73	1.00
Total.....	24.23-47.46	33.81	23.51-42.83	30.98	27.36-40.74	33.35	23.65-45.38	32.71	32.57
Standardized depreciation 6/..	3.37-14.22	5.74	1.55- 8.51	4.61	3.87-10.38	6.75	4.72-17.24	7.17	6.09
Standardized interest 6/.....	2.16- 9.03	3.78	1.15- 5.63	3.02	2.50- 6.30	4.25	2.86-10.62	4.37	3.85
Total standardized 7/:	26.96-56.56	38.10	26.39-49.92	34.47	32.61-45.26	37.38	27.00-59.22	38.58	36.99

See table 2 for footnotes.



Table 4--Estimated costs per bale in sample gin plants at 70 percent capacity utilization, by size group, and average for all plants, West Texas, 1970/71 and 1971/72 <sup>1/</sup>

Cost item <sup>2/</sup>	1970/71				1971/72					
	Group : 1	Group : 2	Group : 3	Group : 4	Weighted : average	Group : 1	Group : 2	Group : 3	Group : 4	Weighted : average
	----- Dollars -----									
Management.....	3.30	2.92	2.21	1.61	2.45	3.39	2.86	2.08	1.91	2.25
Insurance.....	.36	.27	.31	.23	.29	.38	.37	.33	.28	.33
Taxes.....	.34	.29	.20	.24	.26	.34	.31	.18	.24	.25
Energy.....	1.79	1.55	1.86	1.64	1.72	2.14	1.89	2.09	2.24	2.08
Labor.....	5.27	3.95	3.65	3.13	3.90	5.55	5.37	4.48	4.77	4.96
Bagging and ties.....	2.96	2.92	3.09	3.07	3.01	3.40	3.47	3.49	3.55	3.49
Repairs <sup>3/</sup> .....	4.96	3.79	3.67	4.18	4.06	3.29	4.00	3.49	4.96	4.01
Miscellaneous <sup>3/</sup> .....	2.57	3.35	2.18	1.69	2.43	2.42	3.35	2.60	2.40	2.73
Out-of-pocket subtotal <sup>4/</sup> .....	21.55	19.04	17.17	15.79	18.12	20.91	21.63	18.75	20.34	20.10
Depreciation.....	2.61	1.52	2.90	2.51	2.41	1.75	1.82	2.36	2.21	2.09
Interest.....	.89	.42	.52	.21	.49	.73	.48	.44	.33	.46
Total	25.04	20.99	20.59	18.51	21.01	23.38	23.93	21.55	22.88	22.66
Standardized depreciation <sup>5/</sup> .....	3.03	2.57	3.14	3.15	2.98	2.71	2.57	2.71	3.21	2.81
Standardized interest <sup>5/</sup> .....	1.97	1.69	1.95	1.93	1.88	1.78	1.68	1.70	1.95	1.78
Total standardized <sup>6/</sup>	26.54	23.30	22.26	20.86	22.97	25.40	25.88	23.16	25.50	24.70

<sup>1/</sup> See appendix for Cost Adjustments and Weighting procedures. Rated hourly ginning capacity: Group 1--8 bales or less; group 2--9 to 11 bales; group 3--12 to 20 bales; group 4--21 bales or more. The universe includes all active gins in the study area. <sup>2/</sup> Taken from gin records and subjected to uniform allocation procedures--see appendix. <sup>3/</sup> Corresponding 1970/71 and 1971/72 costs are not directly comparable due to slight changes in adjustment procedures. <sup>4/</sup> Sample gin costs excluding depreciation and interest. <sup>5/</sup> Sample gin costs using uniform rates in computing depreciation and interest--see appendix. <sup>6/</sup> Out-of-pocket costs plus standardized depreciation and standardized interest.

Note: Individual cost items may not add to total because of rounding.



## APPENDIX: METHODOLOGY

Gins vary widely by type of organization, ownership structure, accounting procedures used, and in many other ways. In analyzing costs reported by sample gins, uniform allocation procedures described below were employed to compensate for some of the differences in accounting procedures.

Costs of hauling cottonseed and lint--such as truckdrivers' wages, truck depreciation, insurance, road-use taxes, associated truck-operating costs, and any other costs not directly related to gin processing were excluded.

### Cost Allocations

Management: Where applicable, includes salaries, bonuses, commissions, expense allowances, house rent, and personal insurance policies for owners and managers; bookkeeping and other office salaries, and home office cost (line companies); social security; and workmen's compensation insurance and any other insurance on management and office personnel.

Depreciation: Includes allowances for depreciation exactly as carried on gin records except for standardized costs. (See Standardized sample gin costs below.)

Interest: Includes interest exactly as carried on gin records except for standardized costs. (See Standardized sample gin costs below.)

Insurance: Includes costs of all forms of insurance on gin buildings, equipment, housing furnished management and labor, cotton products, and automotive equipment (except large trucks and trailers).

Taxes: Includes all taxes on real property only.

Energy: Includes cost of all utilities--electricity, gas, and water--used in ginning and directly related operations.

Labor: Includes cost of gin wages, social security, and workmen's compensation and any other insurance on gin labor borne by the gin; plus any rental housing furnished labor (excludes gin repair labor; see Repairs below).

Bagging and ties: Includes actual cost of bagging and ties purchased.



Repairs: Includes cost of gin repair wages, social security, and workmen's compensation and other insurance on gin repair labor borne by the gin; plus the cost of repair materials and supplies.

Miscellaneous: Includes pickup, tractor, and other automotive expenses; telephone, telegraph, advertising, and promotion costs; legal and audit fees; dues, memberships and subscriptions; annual meetings and director's fees and expenses; conventions and travel expenses; donations and contributions; cotton losses from fire; sampling, compressing, and related charges; gin and office supply costs; and any other costs not included elsewhere.

### Costing Methods

Sample gin costs: Gin costs which have been subjected to the above allocations are identified in this report as sample gin costs.

Standardized sample gin costs: Uniform rates for computing depreciation and interest on investment were used in developing standardized sample gin costs. Depreciation was set at 7 percent of the initial purchase price of capital items carried on the depreciation schedule regardless of age or former method of depreciation. Interest was charged at 8 percent on the estimated average value of the land comprising the gin site and 8 percent on one-half the cost of buildings, machinery, and equipment.

Out-of-pocket costs: Sample gin costs from which depreciation and interest have been excluded.

### Cost Adjustments

Estimates of ginning costs at other than existing levels of capacity utilization were based on relationships assumed in the development of a series of model gins. See: Zolon M. Looney and Charles A. Wilmot, Economic Models for Cotton Ginning, U.S. Dept. Agr., Agr. Econ. Rpt. 214, Oct. 1971.

### Weighting

In computing weighted averages, the simple weighted average cost per bale for each group was further weighted by its representative proportion of the total rated hourly ginning capacity in West Texas. This was done to reflect more accurately the cost of ginning an "average" bale of cotton in West Texas.



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